Exercise 1 Calc. : ✗

In a certain country the growth of a certain rabbit population (per week) can be modelled with the following function:

$$f(x) = 100 \cdot 2^x$$

with $f(x)$ describing the number of rabbits after x weeks and $x = 0$ being the time at the beginning of the observation of the rabbit population.

1. **Give** the number of rabbits, that have been in the country at the beginning of the observation. | 1 mark

2. **Calculate** how many rabbits will live in the country after 1 week and after 3 weeks and **compare** the values. | 4 marks

3. **Sketch** the graph of the function f for $x \in [0, 5]$. **Use** the sheet of graph paper you received at the beginning of the exam. | 2 marks

Exercise 2 Calc. : ✗

Determine the real number(s) for which the following equations are true:

a) $3^{x+2} = 1$ | 2 marks

b) $5^{x-1} = \sqrt{5}$ | 2 marks

c) $\left(\dfrac{1}{4}\right)^x = 64$ | 3 marks

Exercise 3 Calc. : ✗

The figure shows a pyramid **ABCDS** with a square base.
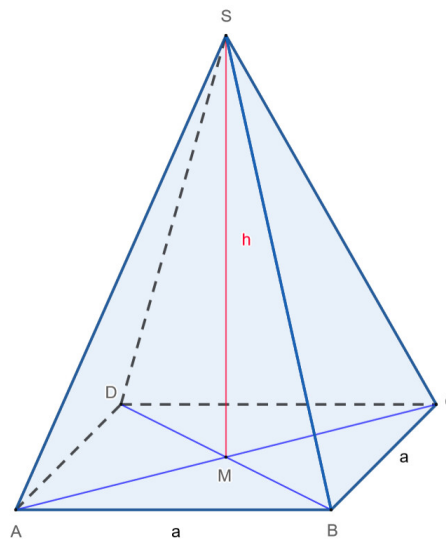The base is $a = $ **AB** $= 6$ cm and the height of the pyramid is $h = 4$ cm.

Please note: the figure is not to scale.

1. Given that the formula for the volume of a pyramid is

$$V = \frac{\text{Base area} \cdot \text{height}}{3}$$

   Calculate the volume of this pyramid. | 2 marks

2. **Calculate** the height of triangle **BCS** from **S**. | 2 marks

3. **Calculate** the area of triangle **BCS**. | 2 marks

4. **Calculate** the surface area of this pyramid. | 3 marks

Exercise 4

1. **Determine** what each angle in degrees is equivalent to in radians:

   i. 45°   ii. 150°   iii. 300°

   3 marks

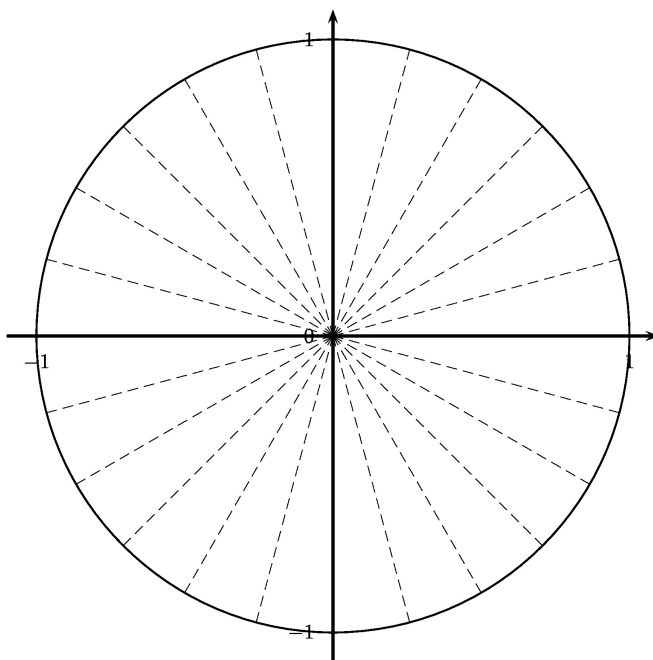2. **Determine** what each angle in radians is equivalent to in degrees:

   i. $\dfrac{1}{3} \cdot \pi$ rad   ii. $\dfrac{5}{4} \cdot \pi$ rad

   2 marks

4. **Insert** those 5 angles listed above on the unit circle

   2 marks

4. Given is $\cos{(60°)} = \dfrac{1}{2}$.

   Based on this information, **find** the value α ($0 < \alpha < 360°$) for which $\cos(\alpha) = -\dfrac{1}{2}$.

   Enter the answer in radians and **plot** it on the above unit circle.

   5 marks